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Original Research

Use of mammography, Pap test and prostate examination by body mass index during the developmental period of cancer screening in Estonia

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SUMMARY

Objectives: Analysis of the use of mammography, Pap test and prostate examination (palpation and/or prostate-specific antigen test) by body mass index (BMI) in Estonia.

Study design: Cross-sectional.

Methods: In total, 7286 individuals aged 16–64 years, randomly selected from the National Population Register, filled out questionnaires in postal surveys in 2000, 2004 and 2008. The target age group was 45–64 years for mammography, 25–64 years for Pap test and 50–64 years for prostate examination. The probability of using these preventive medical services within the past 2 years by BMI was analysed using logistic regression models. Potential confounding variables included socio-economic factors, health behaviour, number of outpatient visits, current self-rated health, study year and age.

Results: Compared with women of normal weight, the probability of mammography use was higher for overweight women [adjusted odds ratio (OR) 1.32, 95% confidence interval (CI) 1.01–1.73], and the probability of a Pap test was significantly lower for severely obese women (adjusted OR 0.51, 95% CI 0.35–0.76). Prostate examination was independent of BMI. In 2008, mammography was predominantly performed within the screening framework for all BMI groups (highest rate in the mild obesity group, 76.2%), while Pap tests were predominantly performed following referral by a doctor (especially in the severe obesity group, 66.7%). The attendance rate for prostate examination was higher for men who rated their current health status as rather poor/poor.

Conclusions: In a country where population-based breast cancer screening works fairly well, cervical cancer screening is in its developmental stage and there is no screening for prostate cancer, the deciding role in referring people for preventive examinations for cervical and prostate cancer is still held by doctors. As such, they should pay particular attention to obese women, as this group has a worse prognosis for cervical cancer, and perform more prostate examinations for preventive purposes.

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Introduction

Obesity is an important risk factor for postmenopausal breast cancer,¹ and obese women experience higher mortality from cervical cancer.² Several studies have found that higher body mass index (BMI) is associated with an increased risk of prostate cancer.^{3,4} On the other hand, studies have found that obese Caucasian women are less likely to report recent screening for breast and cervical cancer,^{1,2} yet overweight and obese men are more likely to have undergone a prostate-specific antigen (PSA) test than their normal-weight counterparts.³

Internationally accepted population-based organized cancer screening is in its developmental stage in Estonia, where a screening register does not yet exist. A project for the early detection of breast cancer was launched in 2002, and a preliminary project for cervical cancer was initiated in 2003. The latter initially failed to cover the whole country and did not commence without difficulty. The abovementioned projects have only involved health-insured women aged 45–64 years for mammography, and 25–59 years for Pap test. Women with a specific birth year are invited for screening each year. The intervals set for mammography and Pap test are 2 years and 5 years, respectively. Since 2007, both projects have been implemented within the National Cancer Strategy framework.⁵ Screening for prostate cancer is not implemented in Estonia. As the incidence and mortality of prostate cancer are very high in Estonia, attempts are being made to develop a model that would render the relevant examinations available and facilitate early diagnosis of this disease.⁵

A pilot project for the early detection of prostate cancer with PSA testing was launched in 2008 among men aged 50–70 years from a specific neighbourhood in Tallinn.⁶

In 2008, 373,172 women aged 25–64 years resided in Estonia, and approximately half of them were aged 45–64 years. There were 106,462 men aged 50–64 years. Overall, 51.9% of women aged 25–64 years, 69.3% of women aged 45–64 years, and 70.3% of men aged 50–64 years were overweight or obese.⁷

The aim of this study was to analyse the use of mammography, Pap test and prostate examination (palpation and/or PSA test) among overweight and obese individuals compared with individuals of normal weight in Estonia in 2000–2008.

Methods

Data for this analysis were drawn from three health behaviour surveys (2000, 2004 and 2008) among the adult population (aged 16–64 years) in Estonia that included questions concerning mammography, Pap test and prostate examination. The 2004 survey excluded the question about prostate examination. The 2004 and 2008 surveys had an additional question on who initiated the most recent examination. The crude response rate of the surveys decreased from 67% in 2000 to 60% in 2008. The response rates were higher for women, older individuals and rural inhabitants in all surveys. Non-respondents were more likely to be male; the percentage of

rural residents, age groups and different ethnicity groups differed between the surveys. The health behaviour survey is part of the Finbalt Health monitor co-operative study that has been held on alternate years in Estonia since 1990. A simple random sample from the National Population Register was used; the sample size per survey was 2000 in 2000, and 5000 thereafter. All of the surveys were conducted as postal questionnaires on the basis of a common methodology.

Studied variables

BMI [body weight (kg)/height² (cm)] was calculated based on self-reported weight and height. Underweight individuals (approximately 3% of the respondents each year) were excluded from the analyses. Normal weight was defined as BMI = 18.5–24.9, overweight as BMI = 25.0–29.9, mild obesity as BMI = 30.0–34.9 and severe obesity as BMI \geq 35.0. Attendance at mammography, Pap test and prostate examinations over the past 2 years was analysed. Target age groups (45–64 years for mammography, 25–64 years for Pap test and 50–64 years for prostate examination) were selected on the basis of age groups involved in the projects for early detection of cancer in Estonia, and relevant international guidelines.^{8,9}

Potential confounding variables included socio-economic factors (education, ethnicity, income, residence, marital status), health behaviour (smoking status, physical exercise), number of outpatient visits, current self-rated health, study year and age. The highest level of education was designated as follows: basic education (\leq 9 years of study), secondary education (10–12 years of study) and university education (\geq 13 years of study). Ethnicity (which is not related to citizenship) was determined by self-assessment and analysed in two groups: Estonian and other. Income was defined as average monthly net income from all sources for the past 12 months per household member. Due to severely uneven income distribution, a relative scale was used in forming income groups. In the 'very low' group, the relevant income was below the national minimum salary; income in the 'low', 'middle' and 'high' groups was below average, average or above average in the year of the survey, respectively. Place of residence was divided into three groups: capital ('real urban'), other towns and rural. Physical exercise in leisure time referred to exercise for at least 30 min that resulted in heavier breathing and slight sweating. The majority of outpatient medical care (family physician and specialty care visits, excluding visits to the dentist) users in Estonia used the relevant services once or twice per year during the study period.⁷ Therefore, visits in the past 12 months were analysed in three groups: none, 1–2 and \geq 3. As 93% of the Estonian population in 2000 and 96% in 2008 held health insurance,¹⁰ and the state provides health insurance to students in higher education who are permanent residents as well as individuals receiving a state pension in Estonia, insurance status was not taken into account as a possible confounding variable.

Statistical methods

The relationship between the use of certain health services and BMI was described using logistic regression models. Mammography, Pap test and prostate examination served as

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